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09/400,346	09/20/1999	KENTARO TOYAMA	MCS-058-99	3337

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EXAMINER	
LE, BRIAN Q	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/400,346	Applicant(s) TOYAMA ET AL.	
	Examiner Brian Q Le	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,93 and 94* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,93 and 94* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment and Arguments

1. Applicant's amendment filed February 25, 2004, has been entered and made of record.

2. Applicant's arguments with regard to claims 1 and 11 have been fully considered, but are not considered persuasive because of the following reasons:

For claims 1 and 11, the Applicant argues that both Sambonsugi U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 do not teach the limitation of a prediction the provides predictions for a value of each of the plurality of pixels/pixel within image sequence. The Examiner respectfully disagrees. As indicated by the Examiner, Sambonsugi teaches a prediction module that provides predictions for shape by the detection of pixel values (column 4, lines 20-36 and 48-55; column 20, lines 52-67). In addition, Wakitani also teaches an object tracking method (abstract) in sequence images (column 1, lines 6-10) further comprises a prediction module (FIG. 2, box 62) that provides predictions for a value of each of the plurality of pixels (motion prediction values and motion prediction maps for each of the plurality of the pixels) (column 14, lines 25-39). The Applicant further argues (bottom of page 20) that Wakitani teaches motion prediction values are not pixel value predictions. However, Wakitani indicates as cited "**motion prediction values of the respective pixel of the motion prediction value map ...**" (column 14, lines 28-30). Due to the broad limitation, one skilled in the art can reasonably interpret that motion prediction values of the pixel are the prediction values of the pixel since nowhere in the claim specifically stated that prediction values of pixel except/excluding/but no including motion prediction values of the pixel.

3. Applicant's arguments, see Amendment by the Applicant, filed 02/25/2004, with respect to the rejection(s)of claim(s) 93 and 94 under 35 U.S.C 103(a) as being unpatentable over

Sambonsugi U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Talluri U.S. Patent No. 6,026,183 and Black U.S. Patent No. 5,802,203.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 93 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation of a prediction module that provides at least two pixel value predictions for each of the plurality of pixels **without using motion predition** (emphasis added) is not found in the specification.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-7, and 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sambonsugi U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568.

Regarding claim 1, Sambonsugi teaches a system for maintaining a background model (Fig 2, 12) for an image sequence (Fig 20, 141) having a plurality of pixels (Fig 7 and column 19, 18-21), comprising:

A pixel processing module that processes the image sequence on a pixel scale (column 4, line 20-35);

A prediction module that provides predictions for shape by the detection of pixel values (column 4, lines 20-36 and 48-55) (column 20, lines 52-67); and

At least one refinement module that processes the image sequence on a spatial scale other than the pixel scale (column 4, line 37-47).

As disclosed by the applicant, spatial scale includes pixel scale, regional scale or frame scale. Sambonsugi clearly teaches pixel scale, regional scale and frame scale through out the reference (column 4, line 37-47 and column 7, line 5-23). Also, it is inherent that a refinement module can be an error minimization technique or enhancement to optimize a new sequence image.

However, Sambonsugi does not clearly teach a prediction module that provides predictions for a value of each of the plurality of pixels. Wakitani teaches object tracking (abstract) in sequence images (column 1, lines 6-10) further comprises a prediction module (FIG. 2, box 62) that provides predictions for a value of each of the plurality of pixels (motion prediction values and motion prediction maps for each of the plurality of the pixels (column 14, lines 25-39). Modifying Sambosugi's method of maintaining a background model for an image sequence having a plurality of pixels according to Wakitani would able to predict the motion values of each pixel and use them for motion mapping to predict the motion of the tracking

object in the image sequence. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Sambosugi according to Wakitani.

For claim 2, Sambonsugi also teaches the system wherein the pixel processing module further comprises determining an initial background model and providing an initial pixel assignment of each of the plurality of pixels (column 4, line 19-23).

For claim 3, Sambonsugi teaches the system wherein a first refinement module is a region processing module that processes the image sequence on a regional scale (column 4, line 37-47).

Referring to claim 4, Sambonsugi discloses the system wherein the region processing module further comprises considering a relationship between at least some of the plurality of pixels to provide pixel assignment (column 13, line 60-67 and column 14, line 10-15).

For claim 5, Sambonsugi also discloses the system wherein a second refinement module is a frame processing module that processes the image sequence on a frame scale (column 12, 25-50 and 62-67).

Referring to claim 6, Sambonsugi teaches the system wherein the frame processing module further determines a background model that most accurately represents an actual background of the image sequence and performs: (b) substituting a more accurate background model in place of the current background model (column 12, line 0-17).

And for claim 7, Sambonsugi also teaches the system further comprising a postprocessing module that provides enhancement of the image sequence (column 18, line 52-60 and column 31, line 54-67).

Referring to claim 9, Sambonsugi teaches a concept of the system wherein the postprocessing module provides enhancement after the pixel processing module and before the frame processing module (column 32, line 23-35). Furthermore, it also is a designer to have a specific sequence of postprocessing to achieve the desired goal. Therefore, it would have been obvious for one in the ordinary skill of the art to come up with a method wherein the postprocessing module provides enhancement after the pixel processing module and before the frame processing module to output a better quality sequence of images.

For claim 10, as disclosed above, Sambonsugi also teaches the system wherein the postprocessing module provides enhancement after the frame processing module and before the region processing module (column 33, line 0-9 and column 34, line 9-27).

For claims 11, Please refer back to claim 1 for further discussion. Also, Sambonsugi teaches a computer-readable medium (column 35, line 0-3) having computer-executable modules (column 48, line 31-38).

For claims 12-13, please refer back to the discussion of claim 3.

For claims 14-15, please refer back to the discussion of claims 5 and 7.

Regarding claim 16, as discussed in claim 1 with regard to the prediction method, Sambonsugi teaches a method for maintaining a background model (Fig 2, 12) of an image sequence (Fig 20, 141) having a plurality of pixels (Fig 7 and column 19, line 18-21), comprising:

Processing the image sequence on a pixel scale so as to determine a current background model and provide an initial assignment for each of the plurality of pixels (column 6, line 35-48 and column 4, line 19-23); and

Refining the pixel processing by processing on a spatial scale other that the pixel scale (column 7, line 53-64) to further refine at least one of: (b) the initial pixel assignment (column 13, line 60-65 and column 14, line 0-15).

For claims 17-19, please refer back to the discussion of claims 3, 5 and 7.

8. Claim 93 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sambonsugi U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 and further in view of Black U.S. Patent No. 5,802,203.

For claim 93, please refer back to claim 1 for the explanation for previously discussed limitations. However, both Sambonsugi and Wakitani do not explicitly teach a prediction module that provides predictions without using motion prediction. Black teaches an image processing method wherein a prediction module that provides at least two pixel value predictions (predicted pixel brightness values at each pixel) of the plurality of pixels without using motion prediction (predicted pixel brightness values at each pixel has nothing to do with motion prediction) (column 9, lines 19-37). Modifying Sambonsugi's method of processing image sequence according to Black would able to further predict the brightness values of each pixel. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Sambonsugi according to Black.

9. Claim 94 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sambonsugi U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 and further in view of Talluri U.S. Patent No. 6,026,183.

For claim 94, please refer back to claims 1 and 2 respectively for the explanation. However, both Sambonsugi and Wakitani do not clearly teach the concept of disclosing the

concept of the predictions based on a actual history of pixel values for the predicted pixel and a predicted history of pixel values for the predicted pixel. Talluri teaches an image processing wherein using the prediction process (column 13, lines 9-10) of an actual history of pixel values (actual pixel values) for the predicted pixel and a predicted history (predicted values) of pixel values for the predicted pixel (column 13, lines 10-15). Modifying Sambonsugi's method of processing image sequence according to Talluri would able to perform motion compensation on the input frame (column 13, lines 6-8). This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Sambonsugi according to Talluri.

10. Claims 8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sambonsugi et al. U.S. Patent No. 6,335,985 and Wakitani U.S. Patent No. 6,031,568 as applied to claim 7 above, and further in view of Jain et al. U.S. Patent No. 6,263,091.

Referring to claim 8, as disclosed in claim 7, Sambonsugi teaches the enhancement concept of the image sequence. However, Sambonsugi failed to introduce that the enhancement technique can be speckle removal. Nevertheless, Jain teaches the technique to isolate foreground and background using speckle removal (column 17, line 42-52). Therefore, it would have been obvious to use speckle removal as an enhancement technique because speckle removal is well known in the art to use to remove the presence of noise, dirt, breaks, and smudges in input images.

For claim 20, please refer back to the discussion above.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

BL
April 28, 2004

SAMIR AHMED
PRIMARY EXAMINER